

THE CAT'S WHISKER

BULLETIN OF THE CANADIAN VINTAGE WIRELESS ASSOCIATION

VOLUME 6 NUMBER 4

DECEMBER 1976

A.D. CHALLONER Editor

ACROSS THE ATLANTIC

1901

1976



plus:- FLYNN'S FLYING DOCTORS

-RARE-ODD TUBE CONTEST! (p.4)

C.V.W.A. EXECUTIVE COMMITTEE

President: W. Choat (VE3CO), 38 Grenview BLVD. N.,
Etobicoke, Ontario, M8X 2K2

Vice Pres: Rev. A.M. Croft, General Delivery, Churchill, Ontario.

Secretary: M. Chaplin, 81 Golden Orchard Blvd., Hamilton, Ontario.

Treasurer: Sid Prior, 102 Parkhurst Blvd., Toronto, Ont. M4g 2E6

Members At Large: Mike Batsch

Historian: Mike Cox

Noble Haughton

Publisher: Dorian Challoner

Jack Knott

Herman Weber

Quebec Chapter: Barry Coleman (VE2BD), 75 Parkdale, Point Claire, P.Q.

Alberta Chapter: Roy Usher (VE6EA), P.O. Box 68, St. Albert, Alberta

THE CAT'S WHISKER STAFF

Editor: Dorian Challoner, 29 Grenview Blvd. N., Etobicoke, Ontario
M8X 2J9

Co-editor: Mervin C. Fry, 75 Dunlop St., Richmond Hill, Ont.

QRK Editor: Bert de Kat (VE3DPB), Box 137 Lynden, Ontario.

Trading Post Editor: Sid Prior (Treasurer)

"EDITOR'S NOTES"

I hope that you have still been enjoying your Cat's Whisker since the change in editorship; the feedback I have received so far has been very encouraging. Since I had never edited or published before there was certainly a lot to learn - the amount learned varying inversely with the budget! So far the effort expended each issue in writing and collecting material of interest has been considerably less than that required to 'make-up', print and mail each issue. I hope in the future to be able to devote more of my time to writing and improving quality, through the accumulation of publishing experience and through further assistance from our membership, beyond the present contribution.

Sid Prior does a fine job in preparing the Trading Post and Gold Dust articles punctually and in near ready-to-print form; he also arranges the typing of the 300-odd address labels. Bert de Kat, our QRK editor has been managing to prepare an interesting article each issue despite an unusually quiet response from the CVWA hams.* Mervin Fry, our enthusiastic co-editor has made another coup this month with his feature article on Flynn's Flying Doctors, and has many more stories yet to tell. On the mailing side, I receive assistance from Herman Weber, and his family and John Wicks. With three people, well-stocked with do-nuts/chips and coffee/beer, the task can be polished off in a single evening.

With all this help, however, there is still plenty to do around publishing time and the slightest change in my higher priority matters can unfortunately mean a significantly delayed, or worse, lower quality, bulletin to you. Make-up, printing and mailing always seem to be rushed since it takes the better part of three months to develop, receive and decide on the final contents. Under optimum conditions it takes a solid weekend's work to make-up the bulletin into 20 7 1/8" X 11" sheets for photo-reduction and printing. A weekend missed is another week lost. Considerable creativity and judgement is required to package the issue in a pleasing format without a lot of cut and try. I am sure we have this potential in our membership. I will discuss this need and one for standby mailers at the 22 January meeting.

*Bert de Kat's father died very recently so there will be no QRK this month. Our sympathy is extended to Bert and his family.

GOLD DUST (continued)

To the Members who have not sent in their 1976-77 dues (check your Membership Card for dates) you will receive the December issue of the Cat's Whisker, but no more till you are a paid up Member. O.K.?

So from your Old Treasurer have a lovely Xmas Holiday and "A Merry Xmas" to you all, with the best of the " **NEW YEAR**"

NEWS NOTES

*The results of our October election went according to the polls (see top of p.1). Next year promises to be more of a contest since their will be a bone fide nomination committee. Responsibilities of the Members-At-Large were decided at an 11 Nov. executive committee meeting: M. Batsch, Social; N. Haughton, Nominations; J. Knott Constitution; H. Weber, Membership Committee Chairman.

*The Fall Picnic was another success, thanks especially to Austin Reesor for arranging the park and, for serving the corn, hotdogs and drinks, Mrs. Chaplin, Mrs. Van der Jagt, and Mrs. Dougherty. The food was brought by Mike Batsch. Barry Coleman did a martyr's deed in conducting auction before he ate... of note in the auction was a UZ1325 RCA horn in mint condition. Ernie Welling expressed his gratitude to the CVWA for its support of the vintage radio display at Stereo 77, for which Mike Cox deserves the credit. Ernie de Coste (Ottawa) mentioned that if anyone has done any historical research particularly on Canadian radio history and has recorded it on paper he would be pleased to keep a copy on file in the library of the Museum of Science and Technology in Ottawa. (P.S. -copy to me too!)

*As of Oct. 23 '76 Sid said we had \$704.69 and 287 members.

*Turn off your TV sets Friday nights at 7:30 and tune in As It Happens on 740 AM for programs from the past.

*



If any member has in his collection British-manufactured receivers, tubes, speakers, etc., made between 1922-1927, and carrying an approval stamp which includes the letters BBC within a circle, please drop a line to the Secretary. The British Vintage Wireless Society is compiling a list of early manufacturers and has requested our assistance.

*Rotary Spark Gap; Phil Stoddart has prepared an info. letter you should read before you apply power to your rotary rig, particularly if unfamiliar with H.T and power gndg. See Phil's article in the last issue for address.

GENERAL MEETING NOTICE

22 JAN '77

1 PM

TRACE MANES PK
(Same ol' place)

o BUSINESS

o AUCTION

22 JAN '77

o 'RARE - ODD TUBE
CONTEST' Special Prizes!
(bring your rarest or oddest
tube - to show & tell)

THE GLOBE

DEC 11, DEC

FR 16, 1901.—TEN PAGES.

MARCONI SPANS THE OCEAN WITH WIRELESS TELEGRAPHY.

DEC. 6 1901

MARCONI'S PLAN
FOR A SAFE ROUTE

Arrives in Newfoundland to
Experiment.

EGG HIS SCIENTIFIC WITNESS

Expects to be Able to Communicate
With Vessels Almost in
Mid-Ocean.

Has Received Messages at
His Station in New-
foundland.

DESPATCHED FROM
CORNWALL, ENGLAND.

Will Erect Lofty Pole to
Take the Place of Un-
reliable Kites.

TORONTO, WEDNESDAY, DECEMBER 18, 1901.

MARCONI TELLS WHAT HE DID; ISSUES A SIGNED STATEMENT.

Newfoundland Government
Officially Visits
Him.

DISREGARD PROTEST
OF CABLE COMPANY.

Inventor Says That He Can-
not be Crushed by the
Monopoly.

TORONTO, TUESDAY, DECEMBER 17, 1901.

MARCONI ORDERED TO QUIT BY THE CABLE MONOPOLISTS.

WONDERS OF WIZARD MARCONI'S SYSTEM.

When ships have wireless telegraph instruments they
can locate lighthouses in storm or fog.

They can be directed past dangerous points.

They can be directed to harbor.

They can signal to each other over miles of sea and
transmit messages.

They will be automatically warned of approaching col-
lisions.

They can signal their coming and condition to ports
when far at sea.

The instruments are cheap and durable. It costs little
to run them.

They have already superseded some short cables.

Wireless telegraphy is extending its range hundreds of
miles at a time.

Served With Notice to Re-
move Apparatus and
Cease Further Ex-
periments.

TRIALS TO BE STOPPED
BY AN INJUNCTION.

Anglo-American Telegraph
Company Have Mono-
poly of Telegraph
Business.

DECEMBER 23, 1901.

MARCONI TO VISIT CANADA'S CAPITAL

Will Come in Response to an Invita-
tion Sent by Mr. Fielding to Try
Experiments in Dominion.

CONFER WITH CAPITALISTS.

... ACROSS — THE — ATLANTIC ...

1901 - 1976

A 75th Anniversary

This month marks the seventy-fifth anniversary of Marconi's successful trans-Atlantic experiment and is an appropriate time to review how it was accomplished.

By 1900, the 26 year old Marconi had proven to his own satisfaction that the earth's curvature did not interfere with radio propagation of distances up to 100 miles and that the time was ripe for long distance tests which, if successful, would be of considerable commercial value to both the Marconi Wireless Telegraph Co. Ltd., and the recently formed Marconi International Marine Communication Co. His fellow directors, already committed to heavy capital expenditure reluctantly consented to the raising of further large amounts of money to be risked in the attempt to establish trans-Atlantic communication between the United States and England.

Cape Cod was chosen as the area for a transmitting and receiving site in the U.S. In England, a lonely spot, high above the cliffs on the South Coast of Cornwall, named Poldhu, was chosen because its remoteness ensured privacy. Work began at this site in October, 1900.

It was realised that a transmitter far more powerful than any previously built must be used and Prof. J.A. Fleming, the consultant engineer retained by the Marconi Co., began the preliminary design. A 32 h.p. oil engine drove a 25kV 50Hz Mathew and Platt alternator. The 2Kv alternator output was stepped up to 20Kv and a capacitor spark-gap combination produced an intermediate frequency. A second transformer, spark-gap, capacitor combination resonated at this intermediate frequency, and the new frequency produced at the second spark-gap was radiated.

The antenna consisted of an inverted cone supported by 20 masts each about 200 feet in height, arranged in a circle roughly 200 feet in diameter. A similar antenna was erected at the Cape Cod site. The Poldhu transmitter was completed by the beginning of September 1901.

Later in September, the Poldhu antenna collapsed during a heavy gale and a simpler fan-type antenna was built to replace it. In November, the Cape Cod antenna collapsed and, because of the anticipated reduced range of the simple Poldhu antenna, Marconi decided to attempt one-way communication only at a much closer site in Newfoundland rather than rebuild at Cape Cod.

By mid-November trials were being held and very strong signals from Poldhu were received at Crookhaven in the South of Ireland.

Marconi sailed from Liverpool on November 26 accompanied by two of his assistants, Kemp and Paget. The receiving

1901 - 1976

station equipment, together with balloons, kites, and other supplies, packed in laundry-type hampers was brought with them. They landed at St. John's, Newfoundland on Friday, December 6.

After comparing different sites, Marconi chose a high hill overlooking the Port. It had a small plateau, some two acres in area, where the kites and balloons could be manipulated when raising the temporary antenna. The Cabot Memorial Tower, designed as a telegraph signal station, stood on a crag on the plateau giving the area its name--Signal Hill.

A hospital had been established on the site in a building formerly used as a military barracks and Marconi was given the use of a room in this building. The room was furnished with a table and a single chair. The hampers were brought in and the equipment unpacked.

On Monday, December 9, the installation was complete and one of the 14 foot balloons was inflated with some 1000 cu.ft. of hydrogen gas and an attempt was made to raise an antenna. High winds, however, quickly snapped the balloon's mooring rope and carried the balloon away.

The Marconi crew, bundled up in heavy clothing as some protection against the bitterly cold weather, struggled with kites and eventually raised an antenna wire to a height of about 400 feet. The kite surged up and down over the sea causing the antenna circuit capacitance to change drastically and unpredictably. Marconi was then forced to use an untuned input instead of his recently patented 7777 circuit. Originally, Marconi had intended to use his modified coherer as a detector with its relay and its Morse recorder but the higher noise level due to the untuned input made him decide in favour of the more sensitive earphone which would provide him with a better chance of recognising signal from noise. Removing the relay from the circuit meant that the "tapper" would no longer operate to de-cohere" the detector, so a self-restoring detector was substituted. This consisted of a small blob of mercury sealed between two blocks - one iron, the other carbon, in a glass tube. This 'sandwich' acted as a metallic rectifier and had been developed for use in Italian Navy equipment by Marconi's friend, Lt. Solari.

Shortly after noon (local time) on the 12th December, Marconi heard the three sharp clicks corresponding to the three dots of the letter S in his earpiece. He handed the earpiece to Kemp, who also heard the signal. Further signals were received at 12.30, 1.10, and 2.20 p.m.

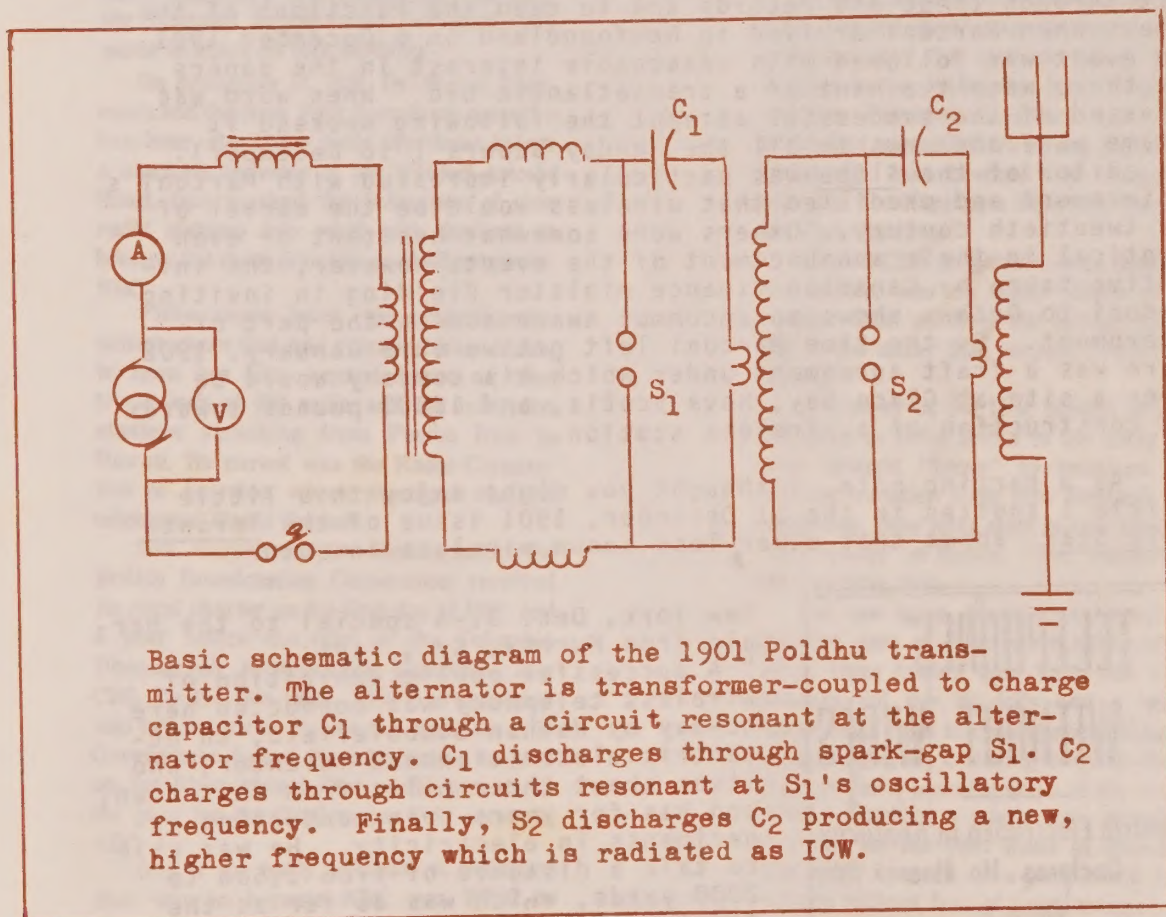
On December 13 the weather deteriorated further and Marconi discontinued his tests and released the news of his success.

For many years after these tests leading radio engineers were puzzled as to what stroke of luck or freak atmospheric

1901 - 1976

condition would enable the long-wavelength used - about 250m - to span the ocean and produce receivable results in such primitive equipment at noon time when the sun is high. A theory that has gained support today is that a harmonic from Poldhu's spark-gap transmitter was reflected and received by the untuned receiver.

The Poldhu site was used with increasingly improved transmitters for long-distance radio communication until 1933, when the station was dismantled. The Marconi Co. gave the site to Britain's National Trust. An enscribed stone column has been erected, but little else now remains to show the significance of this remote spot.



by Maurice Chaplin

Editor's Note:

I think our readers will all agree that Maurice has done a commendable job in sketching this important event from the wireless historian's viewpoint. Maurice in fact visited the historic transmitting site at Poldhu, England just this year....On the other side of the Atlantic I might add that another of our members, Herman Weber, visited the receiving site on Signal Hill, Newfoundland this fall. Thus, you might say, the CVWA has marked this important 75th Anniversary of Transatlantic Wireless with official visits to the historic sites on both sides of the Atlantic!

As It Happened

The 1901 headlines opposite Maurice's article were copied from microfilm records in the Toronto reference library on College St. They may not print too legibly but I hope they will at least give you an idea of the impact of the event as it was actually unfolding. All headlines were taken from page one of the Toronto Daily Mail and Empire. I found it fascinating to sift through these old records and to read the reactions of the time. When Marconi arrived in Newfoundland on 6 December 1901 the event was followed with reasonable interest in the papers but there wasn't a hint of a transatlantic bid. When word was released of the successful attempt the following weekend it became page one news in all the Monday papers (16 December). The editor of the Globe was particularly impressed with Marconi's achievement and predicted that wireless would be the marvel of the twentieth century. Others were somewhat hesitant or even sceptical in their announcement of the event; however, the initiative taken by Canadian finance minister Fielding in inviting Marconi to Ottawa shows an uncommon awareness on the part of government. By the time Marconi left Ottawa on 9 January, 1902 there was a draft agreement under which his company would be given a site at Glace Bay, Nova Scotia, and 16,000 pounds towards the construction of a wireless station.

As a parting note, I thought you might enjoy this little article I spotted in the 31 December, 1901 issue of the Toronto Daily Star about that other, less known wireless inventor:



New York, Dec. 31-A special to the Herald from Murray, Ky., says:

"A successful public exhibition of wireless telephony was conducted here to-day by Nathan Stubblefield, an eccentric electrician and inventor, who lives about three miles from this town, and has for years been conducting experiments in electricity. He was able to talk a distance of from 1,500 to 2000 yards, which was as far as the trial tests were made.

"Stubblefield claims that it is just as easy to communicate for miles as it

is for yards. He contends that the earth, by its revolving, creates a certain amount of electricity which encircles it like a blanket and by absorbing which the earth has become practically a great magnet. He says that the electrical envelope is capable of transmitting the sound of the human voice and that it is possible by erecting the proper receivers to send a single message over any space."

THE HALIFAX HERALD LIMITED

Publishers of The Chronicle-Herald and The Mail-Star



By ALEX NICKERSON

Even as Halifax radio station CHNS celebrates its first half century of service, North America's first commercial network, the National Broadcasting Company, prepares to mark its 50th birthday.

On November 11, 1926, Dr. Walter Damrosch and the New York Symphony opened a four-hour, star-laden radio broadcast before a black-tie audience at the Waldorf-Astoria Hotel, that marked the federation of nine radio stations into what was destined to become the most prestigious of all networks, NBC.

Fifty years later, the original nine-station chain that had extended from Maine to Iowa has been expanded into an electronic web of 230 radio and 217 television stations stretching from Puerto Rico to Hawaii. Its parent was the Radio Corporation of America, whose president was the celebrated David Sarnoff.

NBC was formed two months before the British Broadcasting Corporation received its royal charter on the first day of 1927, and a year before the start of the Columbia Phonograph Broadcasting Company, now CBS. By the late 1930s, NBC had branched into two networks. But, in the 1940s, the U.S. Government forced the corporation to give up the Blue network that would later form the base for the third major U.S. network, ABC.

One of the early affiliates of the chain that was to become NBC was WTIC in Hartford, Conn., a station much sought after in the immediate post-World War I years by owners of crystal sets in Nova Scotia. It was possible, in those days, to purchase a ready-made crystal set. But true radio buffs scorned them, even if they were made by RCA. Far better to construct one yourself.

A crystal set was a perfectly mysterious object, consisting mainly of four parts — a genuine crystal of some natural origin, a gray metallic faceted lump of mineral (gale-na?); an airphone; a tuning coil, made by

wrapping wire around a cardboard cylinder; and a thin wire. The wire was called a cat's whisker and you found radio stations by touching it to various parts and facets of the crystal. Everyone who owned one remembers how the slightest vibration would send the cat's whisker dancing across the crystal, abruptly cutting the signal.

Then there was the problem of fading. An adept crystal set operator sat with a fixed expression and manually held the cat's whisker on the crystal, subtly and deftly adjusting it when the signal wandered. (A few years later, he would switch to a set powered by a single "peanut tube" from Northern Electric.)

It was excellent entertainment for small boys, keeping them quiet for hours on end. Unfortunately, the best reception always seemed to be during the hours long after bedtime. Parental discipline, alas, often triumphed over KDKA's strong signal from Pittsburgh, that beamed the songs and music of The Happiness Boys and The Click-uot Club Eskimos.

Cliquot Club ginger ale, once America's best seller, was an early victim of that invader from north of the border, Canada Dry — the mixer that became Prohibition's darling.

A number of the first crystal sets that appeared in Nova Scotia in the early 1920s were brought "home" by relatives on a summer vacation from New England. On a warm day, they were wont to talk about the "heat waves" in Boston. "Hot" had a different meaning then.

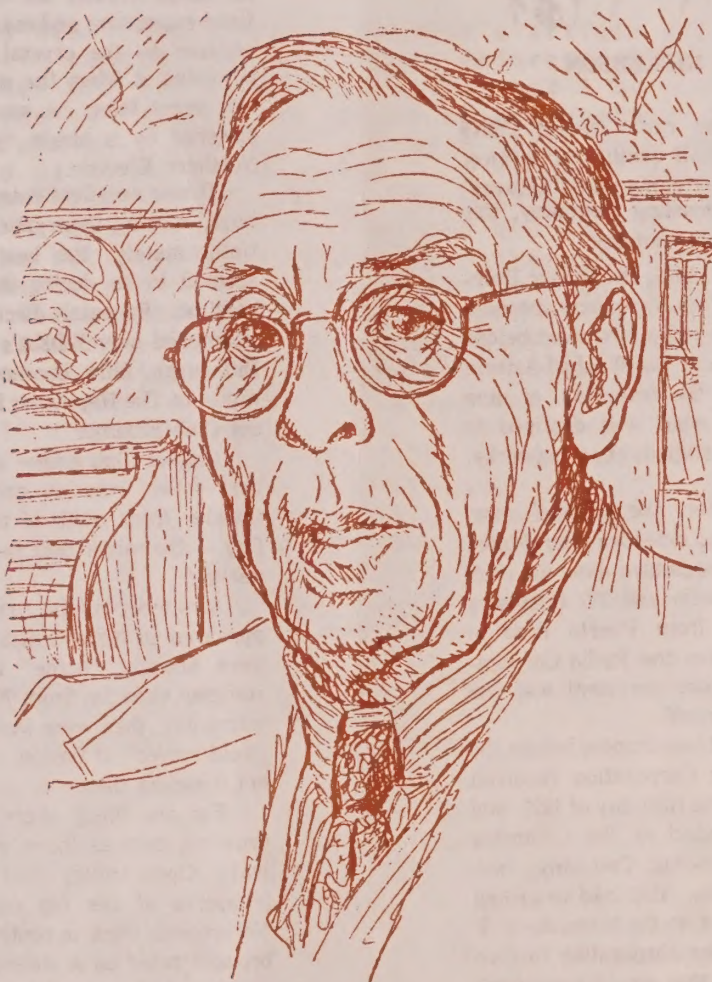
For one thing, there were no miles of crawling cars as there were no superhighways. Open trolley cars were one of the pleasures of the big city and a ride to Norumbega Park in cooling non-polluted air brought relief on a stifling evening. Or you could go for a peaceful drive in the country without meeting a single car, unless you ventured on the Post Road to Worcester. You could even sit on a park bench in the evening without fear of being mugged.

Soda fountains (now returning to popularity) were cool havens and ice-cream sodas and chocolate walnut college ices were a dime. Men wore white trousers and straw hats and women stayed out of the scorching sun. Deep suntan had not become fashionable and it was cooler to keep in the shade or even remain indoors where there would be plenty of ice for cool drinks in the ice-box that didn't depend on electricity, any more than the crystal set did.

FLYNN'S FLYING DOCTORS

by

Mervin C. Fry



"FLYNN OF THE INLAND"
1880-1951

THE VERY REV. JOHN FLYNN, D.D.O.B.E.
FIRST SUPERINTENDENT (1912-51) OF
THE AUSTRALIAN INLAND MISSION
FOUNDER OF THE FLYING DOCTOR SERVICE
MODERATOR-GENERAL OF THE PRESBYTERIAN CHURCH
(1932-1942)

HE BROUGHT GLADNESS AND REJOICING
TO THE WILDERNESS AND THE SOLITARY PLACES

(epitaph)

THE ROYAL FLYING DOCTOR SERVICE OF AUSTRALIA

Wireless - with urgent messages being tapped out "dit-dah" in Morse Code, later superseded by Radio with voice transmission through the Traeger Transceivers - which medium of long-distance communication coupled with qualified medical help and skilful air-piloting, proved instrumental in the formation of the Australian Flying Doctor Service - destined to become one of the most successful services to humanity.

Founders of the Australian Flying Doctor Service

"Flynn of the Inland" (The Reverend John Flynn, Superintendent of the Inland Mission), Hudson Fysh (pioneer outback aviator, founder and chairman of QUANTAS airlines - later "Sir"), Doctor Allan Vickers of Baniambo and Albury, N.S.W., and Alfred Traeger (young Australian wireless-radio genius who invented the Traeger Transceiver) were among those responsible for the creation and successful operation of the Australian Flying Doctor Service.

Australia the Island Continent

The Australian Commonwealth, which includes the island continent of Australia and the island state of Tasmania, is situated in the Southern Hemisphere and is sometimes referred to as the "Land Down Under"

With an area of approximately three million square miles, equivalent to that of the United States, it is bounded on the west by the Indian Ocean and on the east by the South Pacific Ocean - lying between longitudes 113°9' E and 153°39' E, while its northern and southern limits are at 10°41' S and 43°39' S latitude.

The difference in latitude between the extreme north and south points is approximately 2,300 miles and in longitude between the extreme east and west points, 2,500 miles.

Here is the Land of the Flying Doctor

The Inland - two million square miles of country - reaching into the very heart of the Australian continent, the home of the original Aborigine, the land of the great cattle stations (ranches), the place of vast distances and hot menacing deserts - one being only second in size to Africa's Sahara Desert; in area the Inland is as great as France and Spain combined.

This writer, born in Australia, is familiar with conditions in this section of the Inland - as, in 1912, was engaged in the installation of deep-well pumping machinery in temperatures around the 130° mark; areas being jocularly referred to as the three "hot spots" - Hay, Hell and Booligal. Having been successful in bringing the vital water to the surface in two of these areas, it remains uncertain as to the future of the third place mentioned!

However, the possibility of irrigation was clearly visible - especially when the long-range plan of the life-giving water is brought in, clear across the continent from the rainy section of northern Queensland - also dispelling the term of the "Never Never" land! (Incidentally, Jumping Sandhills is printed on the Government Map.)

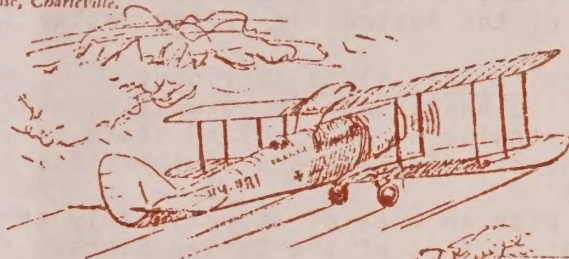
Flynn Arrives

In 1912 an event occurred in Central Australia that was destined to lead to revolutionary changes in the medical services of that sparsely settled area - just horseback communication, camel routes and roads that were merely bush tracks.

This event was the arrival of the Reverend John Flynn, newly



Flying Doctor Base, Charleville.



D.H.50 Aircraft.

ROYAL FLYING DOCTOR SERVICE OF AUSTRALIA



appointed by the Presbyterian Church as the first Superintendent of its Australian Inland Mission.

Flynn soon realized that the ultimate solution to the internal problem was: first, communication by wireless; second provision of medical doctor assistance by small aircraft.

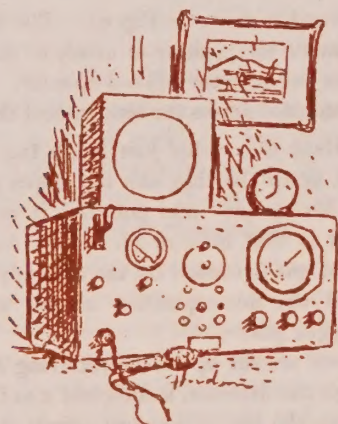
Pedal Wireless

The first short and long distance wireless communications within the Inland were achieved by "Pedal Wireless" ... for message transmission, electrical current was supplied through a car generator mounted on a stationary bicycle, so geared that the operator pedalled at a high enough speed to generate sufficient current to charge the storage battery and also to receive and transmit messages in Morse Code to be received through headphones.

The Traeger Transceiver

Though steady progress was made, it was many years before Flynn's dream of combining radio, medical services and aviation in the service of Australia's outback could be translated into reality.

Provision of the essential link presented a difficult problem until the genius of Alfred Traeger provided the answer in 1927 by invention of the Transceiver.



Traeger Transceiver.

These combination transmitting and receiving radios were specially built in quantity for the Service by Alfred Traeger, a brilliant young South Australian wireless-radio engineer- who after years of experiments, invented, improved and standardized the Transceiver.

Two main types were developed: a 3-watt set with 6-volt battery and a 20-watt set using a 12-volt battery. The control station operates on a power of 200W.

The Traeger Transceivers have three frequencies - short, medium and long wave. Long wave is common to all listeners and is used generally for communication between Outposts, independently of the Base.

Community of the Air

The first Flying Doctor Base was established at Cloncurry Queensland in May 1928. There are now 14 Bases; the three Bases in Queensland, at Charleville, Cloncurry and Charters Towers have a total of almost 300 licensed Outposts. Radio has established a community of the air spreading over 250,000 square miles.

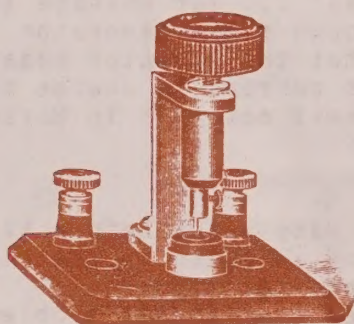
The vast area containing the Bases and Outposts with great distances between is readily apparent when referring to a map or listening to travellers of that region of the Outback such as this writer and his wife, Dorothy Fry. In a 2,000 mile journey by air taking off from the most northerly Base in the Northern Territory, Bases at Charleville, Longreach and Cloncurry were passed on the way to Sydney and Canberra, Federal Capital of Australia, on through the states of Victoria and South Australia.

Space in this article does not permit the full presentation of the operation and achievements of the Royal Australian Flying Doctor Service - a non-profit, non-sectarian organization.

In medical services abroad the Service is indeed regarded as an Australian contribution of no small value to twentieth century medicine. Outside Australia it is also regarded by many as a worthy example of Australian initiative and enterprise.

Electrolytic Detectors

(Excerpts from Ch. XIII, "Wireless Telegraph Construction for Amateurs", 1913)
Alfred Powell ^{by} Morgan



ELECTROLYTIC DETECTORS.

"Bare Point" Type. — Although the electrolytic is the oldest of a long line of very sensitive detectors,* it still holds first rank when in the hands of an experienced and skillful operator. It exists in two different forms, but the more favored is that known as the Fessenden "bare point" type, which consists of a very fine Woolaston platinum wire (.001-.00002 of an inch in diameter) dipping in a small cup of dilute acid. The acid is either 20 per cent chemically pure nitric or sulphuric.



Fig. 91. Bare Point Electrolytic Detector.

A large electrode of platinum wire or foil dips into or is sealed in the bottom of the cup so as to make an electrical connection with the liquid. The fine Woolaston wire is clamped over the cup in a holder which permits of vertical adjustment, by means of a thumbscrew, so that the depth of immersion in the acid may be regulated.

Woolaston wire is covered with a comparatively thick coating of silver, which before using must be removed from the end for about $\frac{1}{8}$ inch by dipping it in strong nitric acid, which will dissolve the silver and expose the almost invisible platinum core. Too much of the fine platinum core must not be exposed or else the surface tension of the acid will cause the wire to curl over and present a large flat surface

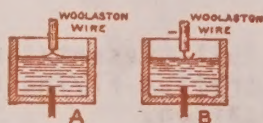


Fig. 92. Effect of Exposing too much Wire.

* The different detectors in order of their sensitiveness are electrolytic, perikon, magnetic, silicon, carborundum.

instead of a fine point. This is a very necessary and important precaution, for the detector is more sensitive as the area of contact between the fine wire and the liquid is smaller.

Whenever this condition is reached the end of the wire should be cut off with a pair of sharp scissors and a new point exposed.

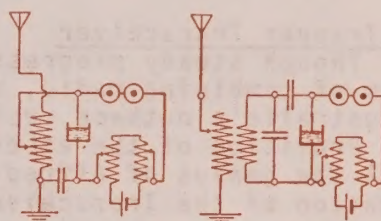


Fig. 93. Electrolytic Detector Circuits.

The detector circuit is shown in Fig. 93. The fine "bare point" is always made the positive or anode of the battery circuit. Otherwise the detector will not operate. A potentiometer must be shunted across the terminals of the battery to reduce the voltage to a value just below that which is required to break down the thin film of oxygen gas which collects on the "bare point" and polarizes it or insulates it from the liquid so that little or no battery current can flow. This film of gas is caused by the electrolysis of the acid solution and the decomposition of the water into hydrogen and oxygen gas.

When oscillations are set up in the receiving aerial and they surge through the detector, a sufficient c.m.f. is generated to break down the film of gas and permit the battery current to flow again. The passage of current causes the signals in the telephone receivers.

The electrolytic cup for the universal detector is illustrated in Fig. 90. It is made of a piece of hard rubber rod $\frac{3}{4}$ inch in diameter and $\frac{3}{4}$ inch high. A recess $\frac{1}{2}$ inch in diameter and $\frac{3}{4}$ inch deep is cut in the top to contain the acid. A small hole $\frac{1}{4}$ inch deep is bored in the under side and threaded with an 8-32 tap. A brass pin $\frac{1}{2}$ inch long, having a corresponding thread, is fitted in the hole. The pin may then be screwed into the small hole in the bedplate. A piece of No. 30 B. S. gauge platinum wire or a strip of platinum foil is clamped between the bottom of the cup and the bedplate and then bent over the top of the cup into the liquid.

A $\frac{1}{8}$ -inch hole $\frac{1}{4}$ inch deep is bored in the lower end of a thumbscrew having an 8-32 thread. A piece of Woolaston wire $\frac{1}{2}$ inch long is placed in the center of the hole and tin-foil packed into the surrounding space with the head of a sewing needle until the wire is held firmly in position. The free end of the wire must then be dipped in some strong nitric acid to remove the silver. The thumbscrew is placed in the collar on the end of the spring of the universal detec-

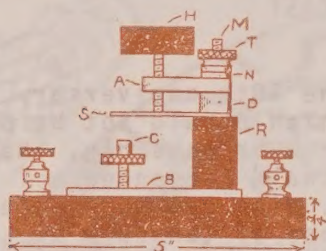


Fig. 98. Universal Detector.

tor and lowered until the "bare point" almost touches the surface of the electrolyte in the cup beneath. Pressure must then be applied to the spring by turning the large adjusting screw until the "bare point" touches the liquid and a click is heard in the telephone receivers and a faint bubbling sound is also audible. The adjusting screw must then be slowly and carefully turned in the opposite direction so as to raise the point until the bubbling changes to a hissing sound. The point is then above the level of the electrolyte in the cup but is still in contact with it because of the capillary action of the fine wire and the liquid.

By using the large adjusting screw as much as possible, instead of the small thumbscrew, the point is raised or lowered without giving it a circular motion and much finer adjustment is made possible. The potentiometer is adjusted until the hissing noise caused by excessive battery voltage just disappears. The detector is then in its most sensitive condition for receiving signals.

When the detector is in use for long periods, the potentiometer must be frequently readjusted to compensate the gradual loss in voltage of the battery. It is well to provide a small switch which will disconnect the battery from the potentiometer when the detector is not in use. In the same case the acid should be removed and placed in a tightly stoppered bottle. A pipette or fountain pen filler furnishes the most convenient means for filling or emptying the cup. The acid must be kept perfectly pure and out of contact with all metals other than platinum. Great care should be exercised in filling the cup, for the acid, if spilled, will not only badly corrode the metal fittings, but will also provide a current leak and seriously weaken the signals.

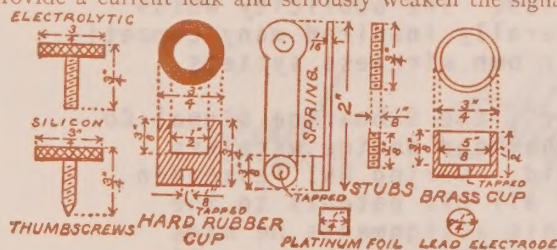


Fig. 99. Parts of Universal Detector.

Lamp Detector.—All electrolytic detectors, more especially those of the "glass point" type, are subject to the annoyance of "burn-outs." That is, the fine platinum wire melts when receiving strong signals from a near-by station.

In such case, the "bare point" must be lowered until it again makes contact with the liquid, and the "glass point" reground until the wire is again exposed.

When this trouble comes often it is very convenient to have at hand a simple detector which will not burn out and which may be substituted for the usual one when great sensitiveness is not required.

Such an instrument is made by snipping off the tip of a small incandescent electric lamp and removing the filament with a wire. One of the leading-in wires is broken off as close as possible to the glass stub and the globe half filled with a 20 per cent acid solution. The broken wire must be made the negative or cathode and connected like a Fessenden or Stone detector. This lamp detector though crude will give good service without burning out when used to receive from near-by stations.

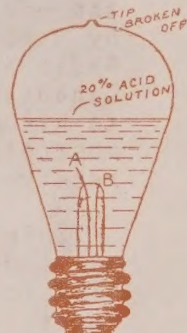


Fig. 98. Lamp Detector.

Increasing the Sensitiveness of an Electrolytic Detector.

—The sensitiveness of an electrolytic detector may be increased in three ways, viz., by connecting two detectors in series, by warming the electrolyte and by agitating it.

The first method is clearly apparent.

The second is accomplished by placing the detector over a sand bath and gently warming it. It will then show a marked increase in the strength of the signals at a temperature of about 30°C . This increase will continue to rise with the temperature until it reaches a maximum at about 60°C .

Branly discovered that a fine stream of gas passed through the electrolyte in order to agitate it increases the strength

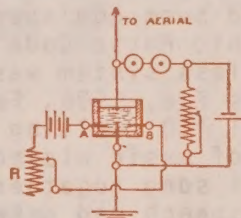


Fig. 102. Increasing the Sensitiveness of an Electrolytic Detector.

of the signals in the phones. He devised a detector provided with two extra platinum terminals sealed in the cup. When connected in series with a battery and an adjustable resistance, these terminals cause electrolysis of the water, and a fine stream of oxygen and hydrogen gas flows through the acid electrolyte. The stream of gas agitates the liquid just sufficiently so that when oscillations strike the detector they augment the breaking down of the film of gas which collects on the fine platinum point. This results in an increase in the battery current flowing through the telephone

receivers of from two to four times and a corresponding increase in the volume of sound. The adjustable resistance is used to regulate the decomposition of the electrolyte and formation of gas, for if this proceeds too rapidly an undesirable rumbling noise will be produced in the telephone receivers.

by Edmund J.O. Eberdt

WORLD'S FIRST RADIO BROADCAST

Nineteen Hundred and Seventy-Six marks the 70th anniversary of the world's first radio broadcast, an event which should not be passed by unnoticed in Canada. Only too few people know or remember, that Radio as we know it today was invented by Reginald Fessenden a Canadian, born in South Bolton Quebec, in 1866. With over 500 patents to his name, Fessenden must be considered as one of Canada's most distinguished scientist and inventor. During his lifetime he received many awards for his outstanding contributions to science.

Fessenden studied and taught at Bishops College in Lennoxville Que. He had been professor of Engineering at Purdue University in Lafayette, Indiana and at Western University in Allegheny, Pennsylvania. In 1887 he worked for Thomas Edison and in 1891 for George Westinghouse in Pittsburg. During his work, Fessenden became extremely interested in the field of wireless communication. In 1902 he convinced two American financiers, Given and Walker, to set up with him the National Electric Signalling Company in Philadelphia. Here he completed the development of his own wireless system which was different from Marconi's and others. In 1905 he designed and built two powerful radio stations for transatlantic communications; one in Brant Rock, Mass., the other in Machrihanish, Scotland. Already in 1906 he was able to send wireless messages across the Atlantic in both directions, which had not been done before. In order to employ his inventions in Canada he founded the the Fessenden Wireless Telegraph Company of Canada in Montreal. Unfortunately the Canadian Government had entered already heavy commitments to Marconi which resulted in Fessenden's failure in Canada. (Contrast this treatment by the government with that given Marconi, on p.8 of this bulletin. - Editor).

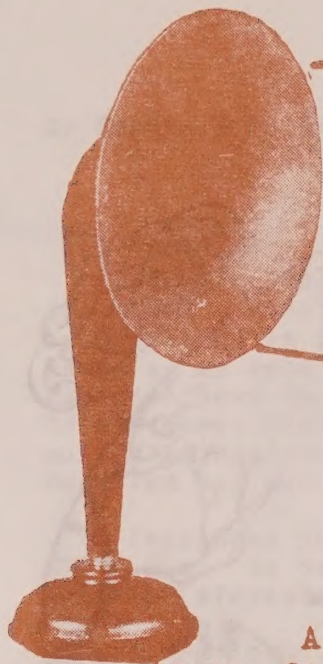
In order to promote his American enterprise, Fessenden decided to offer a great surprise to the many wireless stations on ships which had been equipped with Fessenden Wireless Systems. Instead of telegraphic Morse Code they would hear music and spoken words. Only his wireless system was able to transmit these over the ether. On Christmas Eve, 1906, Fessenden sent from his station at Brant Rock the usual "CQ" calling all wireless stations. Then he transmitted a piece of music played by a phonograph record. After singing a Christmas song together with his co-workers at the station he gave a short speech and asked the listeners to report the reception of his broadcast back to him. Within a short time many replies were received from stations as far as 300 miles. The publicity which this first radio broadcast received naturally inspired many competitors to find new ways of improving their own wireless systems.

In 1912 after the "Titanic Disaster", the Submarine Signal Co. of Boston asked Fessenden to work for them and design wireless equipment for submarine use, which he did. During WWI Fessenden offered his service and the free use of all his patents to the Minister of Militia in Ottawa. During his assignments he made many new inventions in the field of radio. The growing competition in this field after the war involved Fessenden in endless patent litigations, which resulted in a deterioration of his health. Only in 1928 did Fessenden receive several hundred thousand dollars compensation for some of his patents. Later on his radio patents were acquired by RCA from the National Electric Signalling Company for \$3 million. Fessenden spent the rest of his life in Bermuda where he died in 1932.



*Best Wishes for a
Merry Christmas
and Happy New Year*

*from your
CVWA
Executive Committee*



GOLDDUST

By Sid Prior

A.W.A. CONFERENCE CANANDAIGUAR N.Y.

Another 3 interesting days at the Conference.

At the Old Equipment Contest, conducted, as usual, by the King of the Breadboards, our good Friend Ralph Williams. There were 109 pcs. of equipment on display with an estimated value of \$15,000.

You would have to see it to believe it. All Mint condition and beautiful to behold.

Next year, it looks like we will be going to Dearborn, Michigan at the Ford Museum.

So save yor dollars, Fellows, its really worth the Trip.

A note to those who wondered, Yes Paul Nipkow did invent the Scanning Disc in 1884. The source from one who should know, so argue with him.

You might be interested to know that this extract from the German report on the Wireless Exhibition held in Berlin Sept. 3 to 12 in 1926:

Quote: "In our report of last years Exhibition, we mentioned, as an example of the way in which many makers were striving after novelty, the case of the Loudspeaker in the form of a large Sea Shell. This year there is one firm apparently so convinced of the acoustic properties of the Sea Shell, that they display a range of forty photographs of different Shells which are available, ready for attachment of the loud speaker unit."

Submitted by Maurice Chaplin Our Secretary

OUR THANKS to all the Members who so kindly sent in the Dollar Inflation Fighter

His papers were held since 1944 at the North Carolina Archives in Raleigh, which gave them to the Public Archives of Canada in 1974. (Originals, or copies?- Ed.) Here they are now available to Canadian historians on microfilm.

Fessenden has received honorable recognition for his work by many American institutions. The US Navy has named a US Destroyer Escort Vessel after Fessenden. A Memorial plaque has been placed at the site of the first radio broadcast in Brant Rock, Mass. and a Memorial Park has been established in his honour at Manteo, North Carolina. It is hoped that the Canadian Government will do its part one day in giving Reginald Fessenden an honourable place to his memory in Canada.

THE STARS

Meteor trains will carry messages

By DR. HELEN HOGG

Western Union is going to start sending messages by transmitting them through meteor trains high in the earth's atmosphere. Incredible as this sounds, it is true.

Canadians can be justly proud that the groundwork for this imaginative business was laid by Canadian scientists many years ago.

A Canadian project known as JANET, declassified in 1956, was carried out at the Radio Physics Laboratory in Ottawa by P. A. Forsyth (now at the University of Western Ontario) and colleagues.

They showed that wave-lengths as short as those used in line-of-sight transmission could be employed over distances as great as 1,000 miles.

This was done by taking advantage of the ionized particles in meteor trains about 60 miles above the earth's surface.

The train of any one meteor can be used for only a second or so, but there is a multitude of meteors the size of a pinhead which make the transmission possible.

Now Sky and Telescope reports that the Soil Conservation Service of the U.S. Department of Agriculture has awarded Western Union a \$2 million contract for a scheme which uses the JANET principle.

The idea is to get frequent records of the precipitation in 10 western states in which forecasts of water runoff are critical. There, 160 rain and snow measuring stations will

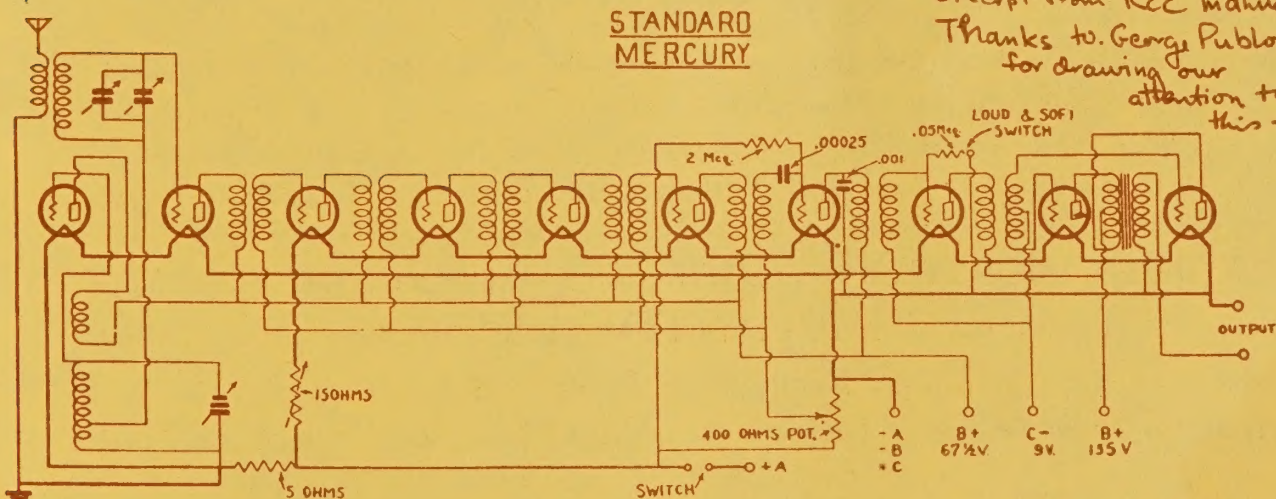
operate fully automatically with transmitters powered by solar energy.

Data which is read every 15 minutes will be stored until one of two central collection stations sends an order to transmit it.

Each remote station will transmit power continually, probing the sky. When a meteor train comes along, another station will receive the signal and trigger a burst of the stored data.

Each remote station will make data transmissions at least twice daily to its central station. The maximum station separation will be 1,200 miles.

The meteor burst system is scheduled to go into operation early next year.



The HAM App Co. Ltd
TORONTO ONT

FLORENCE RADIO

48 Adelaide Street West

Toronto (2), Ont.

PHONE: MAIN 3106

CRYSTAL SET, Complete, Head Set, Aerial, etc.	\$4.90
"FLORENCE" TRANSFORMERS, All Ratios -	\$3.00
"FLORENCE" HEAD SETS, 2,200 OHM -	\$2.50
NAVY TYPE - - -	\$6.00
"BURNS" Loud Speaker, \$30.00 MUSICONE -	\$22.00
AMPLION HORNS - -	\$13.50 to \$45.00
PHILMORE HORNS - -	\$8.50
One Tube Set in Cabinet, with Phones, Tube, Batt's	\$29.00
WORK-RITE Couplers, Variometers, silk wound,	\$3.50
SIGNAL CONDENSERS \$1.50 to \$2.75. Low Loss	\$3.75
Table Type Condensers (enclosed) for Wave Trap	\$6.00
ARGUS LIGHTNING PROTECTORS -	\$1.50

TUBES	Peanut	\$3.50	Westinghouse	\$3.50
	R221D	\$3.50	General Electric	\$3.50
	American 201A,	Guaranteed	\$2.50	

Covered and Bare Wires, All Sizes and Covers—Reliable Batteries, Dry and Wet
Rogers' "B" Battery Eliminator—Valley Chargers, 25 and 60 Cycle
Simplex 3 Circuit Tuners—U.S. Coils—Artcraft L/L Condensers
Acme—Ajax—Aerovox—All American and other Standard Parts

RADIOLA, NORTHERN-VICTOR, STROMBERG, DE FOREST,
AND "DISTANTONE 5" SETS

Let Us Demonstrate In Your Home

Agents Wanted In Every Town

Make Money In Your Spare Time